

THE TERRESTRIAL ISOPODA OF MESOPOTAMIA AND THE SURROUNDING DISTRICTS.

BY

JOSEPH OMER-COOPER, F.L.S.

(With 6 plates and 2 text figures.)

During the last two years collections of Woodlice from the Mesopotamian Region have been sent to me for identification by Mr. Robert Gurney, M.A., Mr. W. Evans and Mr. R. G. Tame, and the specimens in the British Museum have also been examined. These collections contain in all about 150 specimens representing sixteen species of which six appear to be undescribed.

The identification of the specimens has been much facilitated through the kindness of the British Museum authorities, who placed their very extensive collections at my disposal, including the whole of the Budde Lund collection.

Through this I was able in the majority of cases to confirm the identification of the less common species by direct comparison with the type specimens. The Budde Lund manuscript was also consulted and proved of the greatest assistance.

I take this opportunity of expressing my most sincere thanks to the Museum authorities, and in particular to Dr. W. T. Calman, F.R.S., for the kindness which he has shown in giving me every facility to examine the specimens and consult the literature, and also for personally assisting me in the translation of various foreign publications.

The collections show no very striking features, most of the species being found also in Algeria, Egypt or Southern Europe, while the new species are also closely allied to species found in these regions, with the exception of *Periscyphis Tamei*, Sp. n., which appears to be most closely related to certain Central African forms.

The discovery of specimens of *Hemilepistus pectinatus*, Budde Lund, is however of considerable interest as they possess free coxal plates on the 2nd, 3rd and 4th trunk segments, a feature unknown previously in any normal genus of the Oniscoidea.*

* Since this paper was in the hands of the printer I have found in a paper by Dollfus a reference to these coxal plates which is as follows:—

ANOMALONISCUS, Gen. Nov.

“Ce genre qui paraît se rapprocher du genre *Alloniscus* Dana. s'en distingue par le singulier caractère suivant chez les ♀ les parties latérales des segments 2, 3 et 4 du péréon présentent une division très nette qui délimite un large coxopodite, analogue à celui qui s'observe dans le genre *Ligia*. Ce caractère est d'autant plus extraordinaire qu'il est limité à un petit nombre de segments et qu'il ne s'observe pas chez le mâle. Voici du reste la diagnose du genre” Adrian Dollfus 1893 Bull. Soc. Zool. de France, Tom XVIII p. 187.

Examination of the specimens of *Alloniscus* in the collection of the British Museum reveals the fact that the majority of species have a suture or groove between the coxal plate and the tergum in the 2nd, 3rd and 4th trunk segments only, and that this character is confined to the female sex.

I have also received a letter from Mr. Harold Jackson, M.Sc., who has been working upon the genus *Ligia* and who kindly examined a number as regards their coxal plates. His observations appear to me to be of considerable interest and I am therefore quoting the greater part of his letter.

“Your request has incited me to look into the point at once in the hope it will be of use to you and I have examined some 50 *Ligia* to-day with the following results: 24 of the specimens were male and 23 female.” By “every segment” I mean “every thoracic segment.”

Ligia exotica, Roux.

♀ 2, 3 and 4 separated by very deep grooves 1, slightly grooved, 5, 6, 7 progressively less deeply grooved towards the metasome.

♂ Exceedingly faint indications only (as a matter of fact I can quite excuse anyone unprovided with a first rate binocular microscope not seeing them at all).

L. pallasi, Brandt.

♀ Coxa on every segment separated by very deep grooves.

That another species, *Porcellio Calmani*, Sp. n., which shows this structure, should be found in the same district, is a remarkable coincidence especially as the genus *Porcellio* (to which *Hemilepistus* is very closely related) is of great size and very widely distributed.

It is possible that a careful examination of the known species of *Porcellio* might reveal the presence of free coxal plates in other species as the suture lines are not very conspicuous, but though I have examined a considerable number of species I have not so far observed it.

In the examination of this collection, though no very large number of specimens were dissected, the variability of certain features was very noticeable.

A number of species from Northern and Central Africa and Great Britain have also been examined and these have also proved very variable.

In the majority of cases species have been described from specimens of one sex only and not infrequently from single specimens and as this fact is often omitted from the description considerable confusion arises.

The chief features in which I have found the sexes to differ are as follows:—

The size and distribution of the tuberculations.

The size and shape of the lobes of the head, though, this is rarely well marked.

The structure of the epistome, though but slightly.

The comparative and total length of the joints of the antennal flagellum.

The number of brushes on the mandibles and their distribution.

The shape, size, number and notching of the teeth of the outer endite of the maxillula.

The size and number of the spines of the peraeopoda. This is usually well marked especially in the first pair.

The shape and size of the second joint of the seventh peraeopod especially in *Periscyphus* and allied genera where it is usually very marked.

The length of the uropoda which are often much longer in the male than the female especially in the genus *Porcellio*, where in some South European and North African forms, the length of the uropoda in the male is very great.

♂ 2—6 deeply separated. Others with distinct shallow grooves

L. Oceanica (Linn).

♀ Very deep grooves separating coxa on every segment.

♂ Distinct or deep grooves on every segment.

L. Offerii, Brandt.

♀ 2, 3 and 4 very deeply grooved. In other segments absent or very faintly marked.

♂ Exceedingly faint indication or no trace of a division.

L. Cinerascens, B-L.

♀ Very distinct grooves on every segment.

♂ Very faint indications only.

L. Nova-Zealandica Dana.

♀ 2, 3, and 4 very deeply grooved, other segments more or less well marked.

♂ No specimens in my possession.

The result of this small investigation seems to me very interesting.

It is very obvious that the presence or absence of separated coxa in the male only is not without specific importance, as the character is remarkably constant in the species.

The females all agree in having the character more strongly marked in segments 2, 3 and 4 than any male. It is more or less marked in the other segments, but not so specifically distinct as to have much value.

(Signed) HAROLD G. JACKSON.

The principal variations which I have noticed amongst individuals of the same sex are :—

Size.—Very considerable differences are often found between individuals apparently adult.

Colour.—

The tuberculation of the body, but variation in this respect is not great. The size and shape of the lobes of the head which vary to some extent with age and sex.

The development of the coxal and pleural plates and the degree of sinuosity of the hinder margins of the trunk segments, though this is not very well marked, is of some importance as these features have been made much use of by some systematists.

Number of ocelli.

Number of "olfactory" setae on the antennule.

Length of the joints of the antennal flagellum, though variation in this is usually slight

Number of brushes on the mandibles, and their arrangement. This character seems particularly variable.

The remaining mouth parts and the uropoda also show occasional variation, but this is not usually well marked.

A list of the species with the number of specimens from each locality is given below :—

List of species.						
	Amara.	Baghdad.	Kizil Robat.	uz N.E. of Baghdad.	Mosul and Korind.	Baku.
<i>Cubaris officionalis</i> (Dumeril)	19	..	4	..	..	..
<i>Periscyphis</i> (= <i>Cercocytonus</i>) <i>Tamei</i> , Sp. n. ..	2	..	..	4	..	..
<i>Pareluma minuta</i> , Sp. n.	9	..	..	..	..	..
<i>Porcellio</i> (<i>Porcellio</i>) <i>blattarius</i> , B-L.	2	..	..	..	..	..
„ (<i>Porcellio</i>) <i>Evansi</i> , Sp. n.	7	2	1	..	..	..
„ (<i>Rogopus</i>) <i>laevis</i> (Latr.)	5	10	..	..	..	..
„ (<i>Rogopus</i>) <i>Calmani</i> , Sp. n. .. .. .	..	..	..	..	..	8
„ (<i>Angara</i>) <i>lenta</i> (B-L.)	3	..	..	..	..	..
„ (? <i>Agabiformis</i>) <i>rufobrunneus</i> , Sp. n. ..	5	..	..	..	..	..
<i>Hemilepistus pectinatus</i> , B-L. .. .. .	..	..	..	..	15	..
<i>Leptotrichus politus</i> , Sp. n.	8	..	..	..	..	..
<i>Porcellionides</i> (= <i>Metaponorthus</i>) <i>litoralis</i> (B-L.) ..	9	..	..	..	..	..
„ „ <i>swammerdami</i> , (Aud. & Savig.) ..	19	2	1	..	..	..
„ „ <i>uniformis</i> (Koch). ..	8	..	..	..	..	..
„ „ ? <i>pruinus</i> (Brandt). ..	2	..	..	..	..	..
<i>Philoscia elongata</i> , Dollf.	7	..	..	..	..	..
	14	3	3	1	1	1

Cubaris officionalis (Dumeril).

Dumeril, 1816.

Localities.—Amara : Capt. P. A. Buxton, Capt. W. E. Evans, Mr. R. G. Tame.

Kizil Robat, N. E. of Baghdad: Capt. W. E. Evans, 4 specimens.

Periscyphis (= *Cercocytonus*) *Tamei*, sp. n. (Plate I).

Localities.—Amara: Mr. R. G. Tame, 2 specimens.

Ruz, N. E. of Baghdad: Capt. W. E. Evans, 4 specimens.

Description.—Body convex, capable of rolling into a ball, nearly smooth with a few small irregularly scattered setae and minute punctations.

Head with the lateral lobes small and the front straight. Epistome without marginal line and nearly flat. Antennal tubercles small and thin walled: clypeus rising steeply from the epistome which is slightly raised in the middle close to the origin of the clypeus. Eyes of moderate size with about 15 ocelli.

Mesosome with the coxal plate of the 1st free segment raised to form a rounded ridge separated by a deep groove from the tergum. This groove ends blindly behind, but in front is continued as a narrow and shallow depression which runs round the anterior edge of the segment behind the raised line which forms the articular edge; the outer collar line being a continuation of the raised coxal plate. The raised coxal plate is of a pale yellow colour and marked by numerous fine longitudinal striations; a condition which appears general where such raised coxal plates occur, for in all the species of *Microcerus*, etc., which I have examined, they have a similar appearance.

The hinder margin of the 1st segment nearly straight; the posterior angles rounded, with a deep notch which receives the edge of the 2nd segment when the animal rolls up: 2nd, 3rd, 4th, 5th and 6th segments with the hinder margins nearly transverse, without sinuosity, and the posterior angles rounded and entire: 7th segment with the posterior angles somewhat posteriorly produced and rounded.

Metasome with the pleural plates of the 3rd, 4th and 5th segments quadrangular.

Telson triangularly produced in the middle, and the apex a little rounded.

Antennules with three joints, the 2nd and 3rd joint being subequal and the 1st a little longer than the other two together; apex with about 12 "olfactory" setae.

Mandibles: Right with 2 brushes. Left with 3.

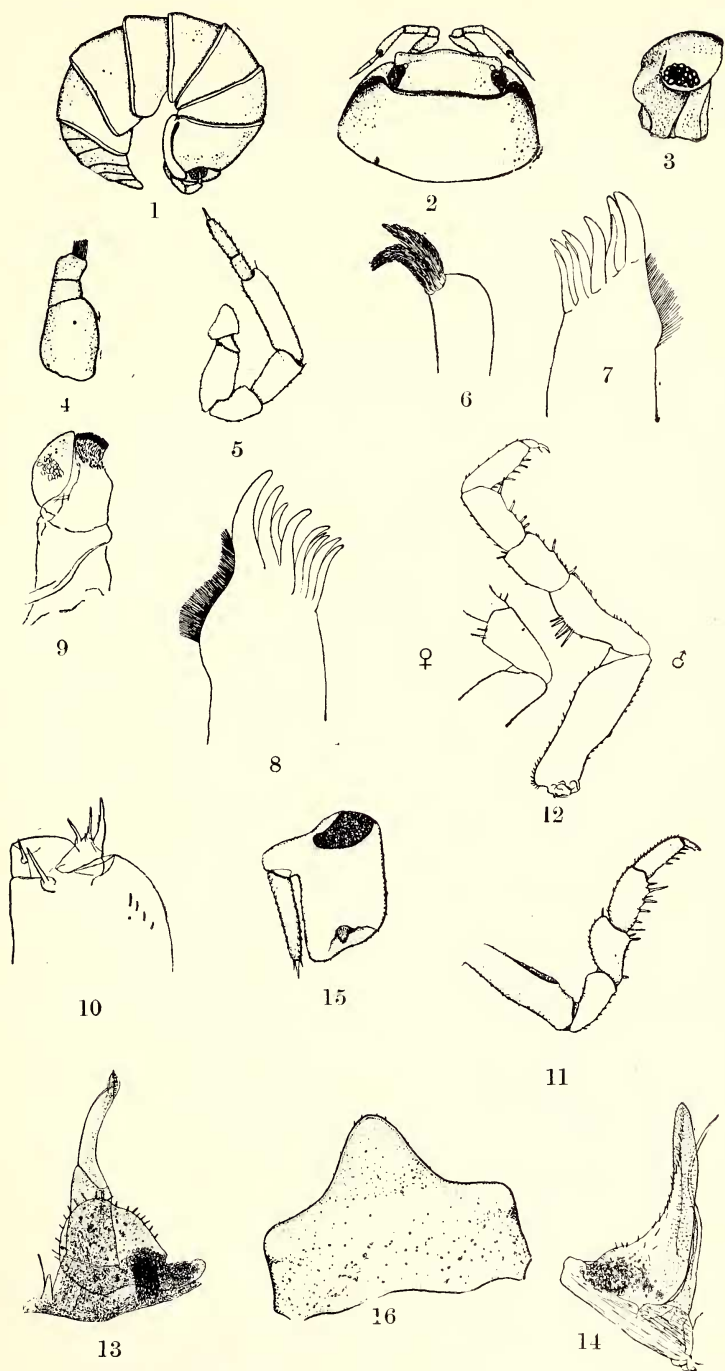
Antennae slightly longer than the 1st trunk segment, 2nd joint a little longer than the 3rd which is slightly shorter than the 4th: flagellum biarticulate, the 1st joint about $\frac{1}{4}$ th shorter than the 2nd.

Maxillulae: Inner endite without posterior spine, with two long slender brushes, the lower being the longer. Outer endite in the female with 4 major teeth, all well developed, though the 2nd is slender, and 4 minor teeth, the 1st and 3rd slightly notched. In the male there are 4 major and 5 minor teeth and both are rather more curved than in the female. The minor teeth all have the apex entire or nearly so. It is possible that one of these conditions is abnormal as I have only dissected the two specimens.

Maxillae with the outer lobe a little wider than the inner, and without a basal lobe on the outer margin.

Maxilliped with the last joint of the palp produced as a stout spine. Middle region with two stout spines each having a small spine at the base, and there is a third small spine between the two stout ones. The basal joint of the palp has a single stout spine. Endite with one spine and without teeth.

Peraeopoda show marked sexual dimorphism especially noticeable in the number of spines carried by the 1st pair, which is small in the female



Periscyphis (=Cercocytonus) *Tamei*, sp. n.

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EXPLANATION OF PLATE I.

Periscyphis (= *Cercocytonus*) *Tamei*, Sp. n.

1. Adult female.
2. Head and 1st segment of female.
3. Head of female side view.
4. Antennule of male.
5. Antenna of male.
6. Inner endite of maxillula of male.
7. Outer endite of maxillula of female.
8. Outer endite of maxillula of male.
9. Maxilla of male.
10. Maxillipede of male.
11. 1st peræopod of female.
12. 7th peræopod of male and part of 7th peræopod of female.
13. 1st pleopod of male.
14. 2nd pleopod of male.
15. Uropod of male.
16. Telson of male.

and large in the male, and in the 2nd joint of the 7th pair, which is short and stout in the female, and long and narrow in the male.

Pleopoda : 1st two pairs with pseudotracheæ.

Uropoda with basal joint flattened ; endopodite reaching nearly to the end of the telson, and the exopodite very small, and situated in a shallow pit on the upper surface of the basal joint a little behind its distal margin in a medium position.

Colour—Pale lemon yellow with dark chocolate markings. The coxal plates are yellow for the greater part of their width and in the anterior region of the segments this light area extends considerably on to the tergum but just behind the posterior margin—which is itself nearly white—there is a narrow dark band running nearly to the lateral margin of the segment. The median dark area is narrow anteriorly but becomes broader posteriorly, being widest in 5th, 6th, and 7th trunk segments. There are small light markings running down the median line. The head is yellow with a few indistinct dark mottlings. The metasome has the first two segments yellow and the last three somewhat darker with the pleural plates nearly white. The telson and uropods are very pale yellow and the legs and pleopods are nearly white.

Length, 10 m.m. *Breadth*, 4 m.m.

Remarks—This species is placed in the genus *Periscyphis* for the following reasons :—

Budde Lund 1885, formed the genus *Cercocytonus*, which he later 1908 (a) considered to be equivalent to Gerstaecker's *Periscyphis*, 1873. In 1910 he restricted the genus considerably, re-defined Dollfus *Synarmadillo*, and created the new genus *Microcercus*. More recently Stebbing, 1911, has formed the genus *Paraperiscyphis*, which is easily distinguished from Budde Lund's genera, and Pearse, 1915, the genus *Minca*,—which he has not very clearly defined and which appears to be very close to *Microcercus*. Collinge, 1914, considers *Periscyphis*, Gerst., distinct from *Cercocytonus*, B. L., which further complicates the matter and the whole group is badly in need of revision.

To add to the confusion, by the addition of a new generic name, would seem undesirable. I therefore place the species described above in the genus *Periscyphis*, while pointing out that it cannot be included in that genus as defined by Budde Lund, 1910, nor in any of the allied genera as he restricts them. It shows a close relationship in some respects to the genus *Microcercus* which is confined to Africa.

Pareluma, Gen.n.

Definition—Body convex, capable of rolling into a ball. Head with lateral lobes small, and antennal tubercles forming two curved and narrow ridges. Eyes small with several ocelli. 1st segment of the mesosome with the lateral margins thickened and notched posteriorly to receive the coxal plate of the 2nd segment. Flagellum of antenna biarticulate, the 2nd joint at least twice as long as the 1st. Telson triangular. Uropoda similar to those of *Armadillidium*.

Generotype—*Pareluma minuta*, Sp.n.

Remarks—This genus is very near to *Eluma* but may be easily distinguished from it by the eyes, which consist of but one ocellus in *Eluma*.

The following species are included :—

<i>Armadillidium Davidi</i> ,	Dollf.	<i>Armadillidium hybridum</i> ,	B. L.
„	<i>Festie</i> ,	„	<i>Oertzenii</i> ,
„	<i>fissum</i> ,	„	B. L.
„	<i>granum</i> ,	„	

Pareluma minuta, Sp.n. (Plate II).

Locality—Amara: Capt. W. E. Evans, 13th November 1918.

9 female specimens.

Description—Body convex, capable of being rolled into a ball; surface smooth, with a few setae irregularly scattered.

Head with the lateral lobes small and the front almost straight. Epistome with distinct marginal line, and a median tubercle forming a distinct ridge. Antennal tubercles well developed, forming two curved ridges running upwards and inwards. Eyes small with about 6 ocelli.

Mesosome with the 1st free segment notched to receive the coxal plate of the 2nd. Edges of all the coxal plates a little thickened: Collar line indistinctly double, the outer line becoming obsolete in the middle dorsally.

Posterior angles of all the segments rounded and hinder margins nearly transverse.

Metasome with the pleural plates of the 2nd, 3rd and 4th segments subquadrangular.

Telson triangular with the apex broadly rounded.

Antennulae three jointed, 1st joint about $\frac{1}{3}$ rd longer than 3rd, 2nd very short; apex with about 7 "olfactory" setae.

Antennae reach to the 3rd trunk segment.

The 2nd, 3rd and 4th joints subequal, the 3rd being the shortest while the 4th is a little longer than the 2nd, and the 5th about as long as the 3rd and 4th together. Flagellum biarticulate and about as long as the 5th joint of the peduncle; the 2nd joint about 3 times as long as the 1st and with a stout apical bristle.

Mandibles: Right with 3 brushes, one on the setose pad and two below. Left with 5 brushes, two on the pad and three below.

Maxillulae: Inner endite with a rather long posterior spine and two short and moderately stout brushes. Outer endite with 4 major teeth—of which the 2nd is very slender but only slightly shorter than the others—and 5 minor teeth—all with the apex entire.

Maxillae with the outer lobe wider than the inner, and a basal lobe on the outer margin.

Maxillipedes with the last joint of the palp ending in a tuft of setae; middle region with two stout spines—the inner being the longer; and basal joint with two stout setae. Endite with a single setae and three teeth, of which the outer is of medium size, the middle large and curved, and the inner very small.

Pleopoda—1st two pairs only with pseudotracheae.

Uropoda similar to those of *Armadillidium*: basal joint notched externally: Endopodite flattened, reaching just beyond the telson: Exopodite slightly shorter than the endopodite, flattened, nearly quadrangular.

Colour—Reddish brown with pale yellow or brown spots. Coxal plates pale yellow. Antennae brown, legs, pleopods and uropods nearly white.

Length, 5 m.m. *Breadth*, 2 m.m.

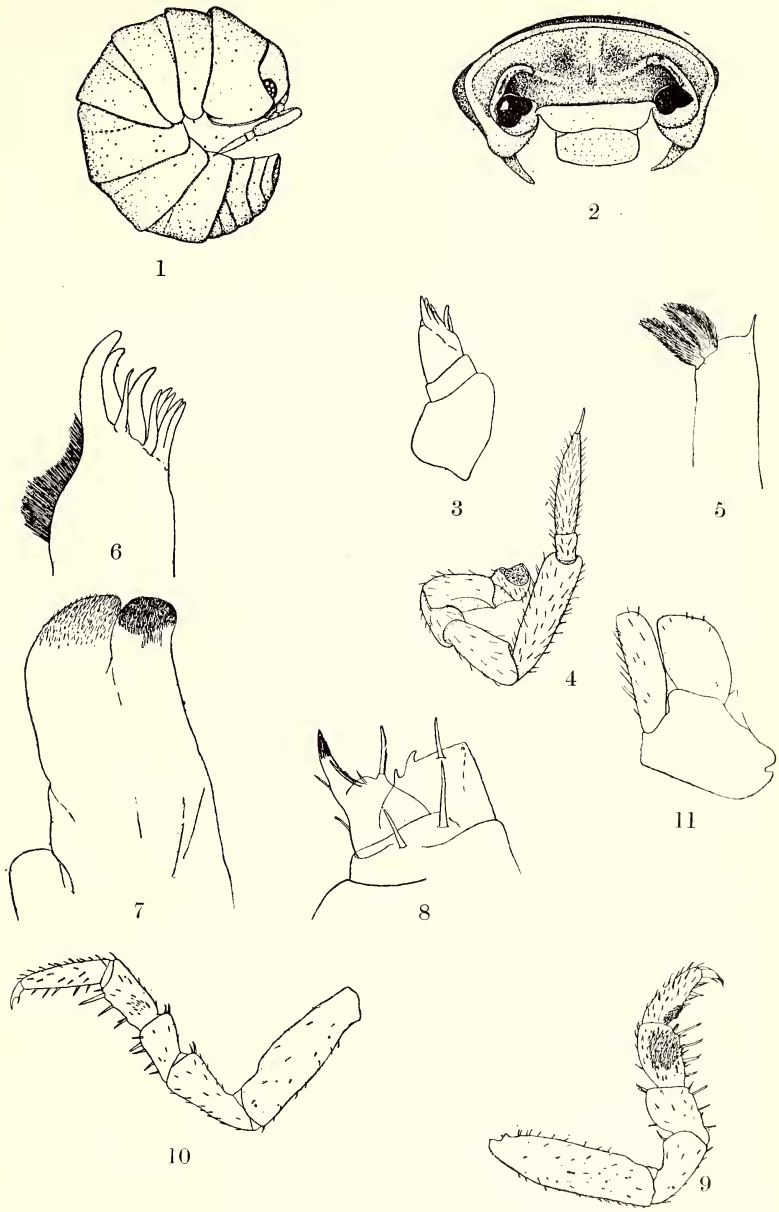
Porcellio (Porcellio) Ulattarius, B. L.

Budde Lund, 1885, p. 131.

Locality—Amara. April-May 1918, Capt. P. A. Buxton, 2 ♀ specimens.

Description—Body oblong oval, not very convex; surface smooth, with fine setae, punctations, and a few small tubercles, most prominent posteriorly.

Head with lateral lobes well developed and rounded; median lobe small, semicircular, and entire. Epistome raised in the middle but without a median tubercle in the female, Budde Lund's description "*Epistoma medio*



Pareluma minuta, sp. n.

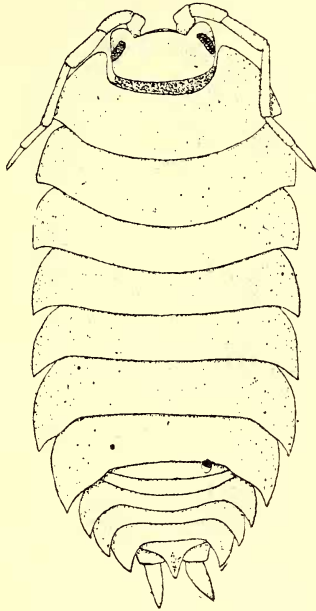
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EXPLANATION OF PLATE II.

Parehuma minuta, Sp. n.

1. Female, ? Adult.
2. Head of female front view.
3. Antennule of female.
4. Antenna ,,
5. Inner endite of maxillula of female.
6. Outer endite of maxillula of female.
7. Maxilla of female.
8. Maxillipede ,,
9. 1st peræopod of female.
10. 7th peræopod of ,,
11. Uropod of ,,

tuberculo obtuso" applies to the male only. Eyes composed of about 25 large ocelli.



Text Fig. 1. *Porcellio (Percellio) Uattarius*, B. L.

Mesosome with the posterior margins of the 1st, 2nd and 3rd segments a little sinuous and the hinder angles sharp. Anterior articular surface of 1st segment with a single collar line dorsally.

Metasome with the pleural plates of the 3rd, 4th and 5th segments triangular and the angles sharp pointed.

Telson subtriangular, with the sides incurved and the apex subacute. Dorsal surface markedly excavated towards the apex.

Antennæ reaching a little beyond the posterior margin of the 2nd trunk segment: 2nd and 3rd joints subequal, the third slightly the longer and both obtusely dentate, 4th joint about $\frac{1}{3}$ rd longer than the 3rd, and 5th as long as the 3rd and 4th together.

Flagellum biarticulate, nearly as long as last joint of peduncle; 1st joint a little longer than 2nd in both sexes. Budde Lund's description "Flagelli articulus prior altero fere duplo longior" does not agree with the female specimens from Mesopotamia, nor with the male specimen in his own collection; but I have found that the comparative length of the joints of the flagellum varies somewhat with age and sex in the genus *Porcellio*.

Maxillulæ: Inner endite with a small curved posterior spine and two brushes, of which the lower is the longer. Outer endite with 4 major and 6 minor teeth of which the 1st, 3rd, 4th and (?) 6th are notched and the 2nd and 5th slender and entire.

Maxillipedes with the palp ending in a tuft of small setæ; the middle region with 2 spines, the outer with 3 and the inner with one seta at the base. Endite with one spine and 3 teeth of which the innermost is small.

Pleopoda : 1st two pairs only with pseudotracheæ. 1st pair in the female large subquadrangular nearly meeting in the middle line.

Uropoda with the basal joint rather widely notched externally : endopodite projecting very slightly beyond the extremity of the telson : exopodite short, lanceolate, with a ridge externally.

Colour.—Grey, with a series of white marks near the bases of the coxal plates, and a white spot at a short distance from the margin of each segment near to the hinder angle. There are also obscure yellow and reddish markings on the back. Antennæ dark grey, legs and uropods nearly white.

Length, 17 m.m. *Breadth*, 8 m.m.

Remarks.—This species is represented in the Budde Lund collection by a single small male specimen of a yellowish brown colour—which is probably due to its having been kept for many years preserved in alcohol in a corked tube. It has been carefully compared with the female specimens from Amara and the points of difference are so slight that there can be little doubt that they belong to the same species.

As a certain amount of confusion has existed regarding this species (see Budde Lund M.S.) and the original description is insufficient I have redescribed it above from the two females from Amara.

Porcellio (Porcellio) Evansi, Sp. n. Plate III.

Localities.—Amara, Cpts. C. L. Boulenger, P. A. Buxton and W. E. Evans.

Baghdad : Cpts. C. L. Boulenger and W. E. Evans. Kizil Robat N. E. of Baghdad : Dec. 1918, Capt. W. E. Evans.

Description.—Body oblong oval, moderately convex, with the coxal plates somewhat flattened ; surface with numerous tubercles arranged in irregular transverse rows.

Head with the lateral lobes well developed, rounded and sloping slightly upwards ; frontal lobe obtusely triangular and deeply notched in the middle, the sides of the notch being raised as distinct prominences. In one specimen examined these had coalesced so that the apex of the triangular frontal lobe was entire and appeared as a single upwardly directed prominence. Epistome flattened, with distinct marginal line, and a well developed median tubercle, which has its apex sharp pointed and directed upwards. It may be seen from the dorsal surface as a small pointed tubercle projecting as far as the two median prominences of the frontal lobe and visible in the notch between them. Eyes with about 25 large ocelli.

Mesosome with the coxal plates projecting laterally : anterior articular surface of the 1st segment with an indistinctly double collar line : 1st, 2nd and 3rd segments with the hinder margin sinuous and the posterior angles acute.

Metasome with the pleural plates of the 3rd, 4th and 5th segments triangular and the angles sharp pointed.

Telson sub-triangular, with the sides much incurved and the apex very slightly rounded.

Antennulæ with the 1st joint twice as long as the 2nd, which is $\frac{1}{3}$ rd shorter than the 3rd ; a small patch of "olfactory" setæ near the apex.

Antennæ reaching to the posterior margin of the 3rd trunk segment : 2nd and 3rd joints subequal, the 3rd being the longer, 4th about $\frac{1}{3}$ rd longer than 3rd, 5th as long as the 3rd and 4th together. Flagellum biarticulate, 1st joint about $\frac{1}{3}$ rd longer than the 2nd in the female, while in the male it is twice as long. This is a well marked sexual difference,



Porcellio (Porcellio) Evansi, sp. n.

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EXPLANATION OF PLATE III.

Porcellio (Porcellio) Evansi, Sp. n.

1. Adult female.
2. Head of female front view.
3. Antennule of female.
4. Antenna of female and flagellum of male.
5. Inner endite of maxillula of female.
6. Outer endite of maxillula of female.
7. Maxillipede of female.
8. 1st peræopod of female.
9. 7th ,, ,, ,,
10. Uropod of female.
11. Uropod of male.